MA1011E MATHEMATICS - II

Pre-requisites: NIL

L	T	P	O	C
3	1	0	5	3

Total Lecture Sessions: 39

Course Outcomes:

CO1: Find the parametric representation of curves and surfaces in space and evaluate integrals over curves and surfaces

CO2: Use Laplace transform and its properties to solve differential equations and integral equations.

CO3: Test the consistency of the system of linear equations and solve it.

CO4: Diagonalise symmetric matrices and use it to find the nature of quadratic forms.

Vector field, divergence, curl, identities involving divergence and curl, scalar potential, line integral, independence of path, conservative field, evaluation of double integral, change of variables, Jacobian, polar coordinates, Green's theorem for plane, finding areas using Green's theorem, triple integral, cylindrical and spherical coordinates, mass of a lamina, centre of gravity, moments of inertia, parameterized surface, surfacearea and surface integral, flux, Gauss' divergence theorem, Stokes' theorem.

Laplace transform, sufficient condition for existence, linearity, inverse Laplace transform, Dirac delta function, transforms of derivatives and integrals, shifting theorems, convolution, differentiation and integration of transform, solution of differential equations and integral equations using Laplace transform.

System of linear equations, augmented matrix, existence and uniqueness of solution, Gauss elimination method, elementary row operations, LU decomposition, row-equivalent systems, row echelon form, rank of a matrix, linear dependence, consistency of linear system, linear combination of solutions, general solution. typesof matrices and their properties, eigenvalues, eigenvectors, eigenvalue problems, Cayley- Hamilton theorem, similarity of matrices, diagonalisation, quadratic form, reduction to canonical form.

References:

1. E. Kreyszig, Advanced Engineering Mathematics,10th Edn., New Delhi, India: Wiley, 2015.
2. H. Anton, I. Bivens and S. Davis, Calculus, 10th Edn., New York: John Wiley & Sons, 2015.
3. V. I. Arnold, Ordinary Differential Equations, New York: Springer, 2006.
4. P. Dyke, An Introduction to Laplace Transforms and Fourier Series, New York: Springer